

**U. S. FISH AND WILDLIFE SERVICE  
SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM**

SCIENTIFIC NAME: *Vagrans egistina*

COMMON NAME: Mariana wandering butterfly

LEAD REGION: Region 1

INFORMATION CURRENT AS OF: September 2005

**STATUS/ACTION:**

☐ Species assessment - determined species did not meet the definition of endangered or threatened under the Act and, therefore, was not elevated to Candidate status

☐ New candidate

☒ Continuing candidate

☐ Non-petitioned

☒ Petitioned - Date petition received: May 11, 2004

☐ 90-day positive - FR date:

☒ 12-month warranted but precluded - FR date: May 11, 2005

☐ Did the petition request a reclassification of a listed species?

**FOR PETITIONED CANDIDATE SPECIES:**

a. Is listing warranted (if yes, see summary of threats below)? yes

b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? yes

c. If the answer to a. and b. is "yes", provide an explanation of why the action is precluded. We find that the immediate issuance of a proposed rule and timely promulgation of a final rule for this species has been, for the preceding 12 months, and continues to be, precluded by higher priority listing actions. During the past 12 months, most of our national listing budget has been consumed by work on various listing actions to comply with court orders and court-approved settlement agreements, meeting statutory deadlines for petition findings or listing determinations, emergency listing evaluations and determinations and essential litigation-related, administrative, and program management tasks. We will continue to monitor the status of this species as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures. For information on listing actions taken over the past 12 months, see the discussion of "Progress on Revising the Lists," in the current CNOR which can be viewed on our Internet website (<http://endangered.fws.gov>).

☐ Listing priority change

Former LP: ☐

New LP: ☐

Date when the species first became a Candidate (as currently defined): 1997

☐ Candidate removal: Former LP: ☐

- \_\_\_ A – Taxon is more abundant or widespread than previously believed or not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.
- \_\_\_ U – Taxon not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status due, in part or totally, to conservation efforts that remove or reduce the threats to the species.
- \_\_\_ F – Range is no longer a U.S. territory.
- \_\_\_ I – Insufficient information exists on biological vulnerability and threats to support listing.
- \_\_\_ M – Taxon mistakenly included in past notice of review.
- \_\_\_ N – Taxon does not meet the Act’s definition of “species.”
- \_\_\_ X – Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Insects; Family Nymphalidae (butterfly)

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Guam, Commonwealth of the Northern Mariana Islands (Rota)

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: Commonwealth of the Northern Mariana Islands (Rota)

#### LAND OWNERSHIP

The Commonwealth of the Northern Mariana Islands owns the land that supports the last known population of this butterfly.

LEAD REGION CONTACT: Paul Phifer (503) 872-2823, paul\_phifer@fws.gov

LEAD FIELD OFFICE CONTACT: Pacific Islands Fish and Wildlife Office, Lorena Wada, (808) 792-9400, lorena\_wada@fws.gov

#### BIOLOGICAL INFORMATION

Species Description: The Mariana wandering butterfly (*Vagrans egistina*) is endemic to the islands of Guam and Rota in the Mariana archipelago. Like most nymphalid butterflies, orange and black are the two primary colors exhibited by this species. Males and females appear similar in color and size. The overall color is black with a large orange splotch (irregular pattern) that extends from the posterior portion of the forewings to the anterior portion of the hindwings. Obvious stripes or rows of spots are lacking (Swezey, 1942).

Taxonomy: This species was originally described from Guam by Latreille and Godart and is recognized as a distinct taxon (Swezey, 1942).

Habitat: The larvae of this butterfly feed on a single plant species, *Maytenus thompsonii*, which is endemic to the Mariana Islands. This forest herb (Family Celastraceae) is the breeding habitat of this butterfly (Schreiner and Nafus 1996).

Historic and Current Range/Distribution: The Mariana wandering butterfly, originally described from Guam, was considered to be uncommon, but widespread there in the 1930s. It has not been seen on the island since 1979, and is currently considered extirpated from Guam (Schreiner and Nafus 1996). During surveys of Rota initiated in 1995, the host plant of the Mariana wandering butterfly was abundant but only one butterfly population of seven individuals (thought to be all males based on their behavior) could be located. No eggs or larvae could be found (Schreiner and Nafus 1996).

## THREATS

### A. The present or threatened destruction, modification, or curtailment of its habitat or range.

Sweeping ecological changes took place during the Japanese occupation from 1914-1944 (Fosberg 1960; Engbring *et al.* 1986). Extensive removal of native forests for the development of sugar cane was pursued on all of the main islands. Following the war, much of this area was given over to cattle grazing, urban growth, and airport development. In some areas, native forest has reestablished (Engbring *et al.* 1986, Falanruw *et al.* 1989). In 1984, Falanruw *et al.* (1989) estimated that approximately 60 percent of the island of Rota is forested. Donnegan *et al.* (2004) estimated that approximately 48 percent of Guam was forested in 2002.

In addition to human related habitat modification, typhoons are a common occurrence on Rota and Guam and have modified the remaining forests on these islands. Guam, for example, has been affected by typhoons in 37 of the last 50 years (based on records compiled by U.S. Navy, Joint Typhoon Warning Center). During the 1990s Guam experienced 20 typhoons, and supertyphoons (having gusts exceeding 240 kilometers (150 miles) per hour) occur with regularity (about once every 5 to 10 years). There is some evidence that the frequency of severe storms (estimated gusts exceeding 160 kilometers (100 miles) per hour) is increasing in the Mariana Islands. With reference to Guam, the historical record shows increasing numbers of mild (estimated gusts in the range of 80 to 160 kilometers (50 to 100 miles) per hour) and severe storms over the last three centuries, as well as in just the last decade. These storms have been known to defoliate forested areas and down trees which can lead to long-term forest modification. For example, in August of 2004, Typhoon Chaba stalled 25 miles north of Rota for several hours, downing trees and defoliating large sections of the forested areas, especially on the windward side of the island. Vegetation changes associated with this storm have opened up forested areas to desiccation and invasion by alien weeds, making them unsuitable as butterfly habitat. These changes continue today with every successive typhoon that comes through.

There are no conservation efforts being undertaken to reduce the loss of habitat for this species.

### B. Overutilization for commercial, recreational, scientific, or educational purposes.

We are currently unaware if this species is being collected for commercial, recreational, scientific, or educational purposes. However, rare butterflies and moths

are highly prized by collectors (Morris *et al.* 1991), who often take all individuals obtainable (59 FR 18350; United States Department of Justice (DOJ), *in litt.* 1993). For instance, there has been a standing reward for specimens of the rare Hawaiian sphinx moth (*Tinostoma smargditis*) (Zimmerman 1958). On at least two occasions prior to its listing, sphingid researchers from abroad had formally requested specimens of Blackburn's sphinx moth from Bishop Museum staff (F. Howarth, pers. comm., 1999; S. Montgomery, pers. comm., 2000). It is unknown whether the species had been illegally traded or collected prior to or since its listing, and there is no clear agreement among researchers regarding the moth's appeal or lack thereof to black market collectors of Lepidoptera (A. Medeiros, pers. comm. 1998; F. Howarth, pers. comm. 1999; S. Montgomery, pers. comm., 2000). The listing of butterflies as federally endangered may increase their attractiveness to collectors of rare species (DOJ, *in litt.* 1993). Unrestricted collecting and handling are known to impact populations of other species of rare Lepidoptera (Murphy 1988).

No conservation measures have been taken to address these threats for this species.

#### C. Disease or Predation

Numerous alien predators and parasitoids of Lepidoptera have become established, purposefully or adventitiously, in the Mariana Islands and these have been documented to attack and significantly impact other species of native butterflies (Peterson 1957; Schreiner and Nafus 1986; Nafus 1989, 1992, 1993a, b, c). These alien predators and parasitoids undoubtedly contribute to the decline of this butterfly. In addition, on average, two new alien species of arthropods become established each year in the Marianas, and the possibility of the establishment of additional predators and parasitoids that will attack this species is a significant threat.

Ants can be particularly destructive predators because of their high densities, recruitment behavior, aggressiveness, and broad range of diet (Reimer 1993). The latter attribute allows some ants to affect prey populations independent of prey density, and ants can therefore locate and destroy isolated individuals and populations (Nafus 1993a). Ants prey on all immature stages of Lepidoptera and can completely exterminate populations (Zimmerman 1958). During some times of the year, alien ants destroyed virtually all the eggs of the related butterfly *Hypolimnas bolina* in Guam (Nafus 1992), and predation by alien ants is the primary cause of mortality (>90 percent) in Mariana eight spot butterfly (*H. octocula marianensis*) (Schreiner and Nafus 1996).

Small wasps in the family Trichogrammatidae parasitize insect eggs, with numerous adults sometimes developing within a single host egg. The taxonomy of this group is confusing but at least two native species attack the eggs of butterflies in the Mariana Islands, including Mariana wandering butterfly (Schreiner and Nafus 1996). Several alien species are established in the Mariana Islands, including, *Trichogramma chilonis* that effectively limits populations of the sweetpotato hornworm in Guam (Nafus and Schreiner 1986) and is a potential threat to the Mariana wandering butterfly. There has been no recent research on parasitoid wasp impacts to the

Mariana wandering butterfly. However, the impact of parasitoid wasps on non-target species, including butterflies and moths, is well established for other species in the Mariana Islands (Nafus 1992, 1993a, b, c).

The introduced biological control agent, *Brachymeria lasus*, parasitizes up to 20 percent of the pupae of the related butterfly *H. bolina* in Guam (Nafus 1992). While this wasp has not been observed to attack the Mariana wandering butterfly, because no larvae or pupae have been found in the field, this wasp is a potential threat to this rare butterfly (Drost and Carde 1992).

There are no conservation efforts being undertaken to reduce the threat of parasites or predators for this species.

D. The inadequacy of existing regulatory mechanisms.

Alien predatory and parasitic insects are most likely one of the primary causes of the reduction in range and abundance of this butterfly. Some of these alien species have been purposefully introduced by agricultural agencies (Nafus and Schreiner 1989) and importations and augmentations of lepidopteran parasitoids continue. Federal regulations for the introductions of bio-control agents are inadequate (Howarth 1991; Lockwood 1993). The limited Federal review process requires consideration of potential harm only to listed threatened or endangered or economically important species (Miller and Aplet 1993). Existing regulations do not require post-release impacts on non-target organisms, and host range cannot be predicted from laboratory studies (Gonzalez and Gilstrap 1992; Roderick 1992). The purposeful release or augmentation of any lepidopteran predator or parasitoid is a potential threat to this butterfly (Simberloff 1992).

There are no conservation measures being carried out to reduce this threat for this species.

E. Other natural or manmade factors affecting its continued existence.

The Mariana wandering butterflies are good fliers, and in an undisturbed setting, probably existed as a series of meta-populations (Harrison *et al.* 1988), with considerable movement between demes and continued colonization and extinction in disparate localities. Nonnative predators and parasitoids, and the loss of its host plant, have extirpated all populations of this butterfly on Guam and have greatly reduced its numbers on Rota. If the Rota population is severely reduced in size there is now no potential for re-colonization (Brown and Kodric-Brown 1977). New purposeful introductions or augmentative releases of existing parasitoids for control of pest Lepidoptera pose a great threat to this species.

Even if the threats responsible for the decline of this species were controlled, the persistence of the one existing population is hampered by the small geographic range of the known population. Small or single populations are also particularly vulnerable to reduced reproductive vigor caused by inbreeding depression, and they may suffer a loss of genetic variability over time due to random genetic drift, resulting in

decreased evolutionary potential and ability to cope with environmental change (Lande 1988; Center for Conservation Update 1994). Small or single populations are also demographically vulnerable to extinction caused by random fluctuations in population size and sex ratio and to catastrophes such as typhoons (Lande 1988).

There are no conservation efforts being undertaken to address these threats for this species.

#### CONSERVATION MEASURES PLANNED OR IMPLEMENTED

A habitat conservation plan (HCP) for a portion of the island of Rota is currently under development to assist in the conservation of the Mariana crow (*Corvus kubaryi*) (A. Pangelinan, U.S. Fish and Wildlife (USFWS), pers. comm. 2005). Land included in the HCP may provide potential habitat for the species and the butterfly may benefit from enhanced protection from habitat loss and other human activities on Rota. This plan is being developed by the Commonwealth of the Northern Mariana Islands government, local Rota residents, and the USFWS, Pacific Islands Fish and Wildlife Office, and is still in the planning phase.

#### SUMMARY OF THREATS

The host plant (*Maytenus thompsonii*) of this butterfly is still present on Guam, but has severely declined along with the native vegetation of these islands as a result of development, grazing by alien ungulates, and displacement by alien weed species. Loss of habitat plus the impacts of alien parasitoids have probably been the major factors in the butterfly's decline throughout its range and its extinction from Guam. There are no efforts being undertaken specifically to address these threats for this species.

#### LISTING PRIORITY

THREAT			
Magnitude	Immediacy	Taxonomy	Priority
<b>High</b>	<b>Imminent</b>	Monotypic genus	1
		<b>Species</b>	<b>2*</b>
	Non-imminent	Subspecies/population	3
		Monotypic genus	4
		Species	5
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

**Rationale for listing priority number:**

*Magnitude:*

This species' range is very limited and its remaining populations are highly threatened by impacts resulting from the browsing, trampling, and uprooting of its host plants by alien deer, development of lands in or near areas that currently support the remaining population or could support future populations, wildfires in the area where the host plants remain, and predation and parasitism of eggs and larvae by alien ants and wasps. The threats of habitat loss by ungulate browsing and parasitism and predation by nonnative insects occur range-wide and there are no efforts being undertaken to control or eradicate these threats for this species.

*Immediacy:*

Direct threats to the Mariana wandering butterfly from alien predators and parasites and indirect threats from impacts to its host plants by browsing ungulates are all considered imminent because they have been occurring for many years and are on-going.

Yes Have you promptly reviewed all of the information received regarding the species for the purpose of determining whether emergency listing is needed?

Is Emergency Listing Warranted? No. The species is not considered for emergency listing at this time because the immediacy of the threats is not so great as to imperil the species within the time frame of the routine listing process. If it becomes apparent that the routine listing process is not sufficient to prevent large losses that may result in this species' extinction, then the emergency rule process for this species will be initiated. We will continue to monitor the status of the Mariana wandering butterfly as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures.

#### DESCRIPTION OF MONITORING

We conducted literature searches for recent articles on this species and tried to contact relevant species experts regarding the current status of this species. No new information on this species was found, and there is no new information on the numbers of individuals or populations, or on threats to the species.

This level of monitoring is appropriate to update the status of the species because a thorough literature search was conducted as well as relevant species experts contacted. Information contained in this assessment form was verified and any updated information incorporated. This species is not listed in the International Union for Conservation of Nature and Natural Resources Red Data List database (International Union for Conservation of Nature and Natural Resources database 2004).

List of Experts Contacted:

Name	Date	Place of Employment
Aubrey Moore	March 03, 2005	University of Guam
Ross Miller	March 03, 2005	University of Guam
Barry Smith	March 04, 2005 & July 11, 2005	University of Guam
Fred Amidon	July 11, 2005	U.S. Fish and Wildlife Service

Holly Freifeld	July 11, 2005	U.S. Fish and Wildlife Service
Laura Williams	July 11, 2005	CNMI Division of Fish and Wildlife, Saipan
Donald Nafus –attempts to locate his new address via Barry Smith, of University of Guam, and by internet search was unsuccessful.		
Ilse Schreiner –attempts to locate her new address via Barry Smith, of University of Guam, and by internet search was unsuccessful.		
Anne Brook	September 19, 2005	U.S. Fish and Wildlife Service

#### List of Databases Searched:

Name	Date
International Union for Conservation of Nature and Natural Resources	2004

#### COORDINATION WITH STATES

We contacted CNMI Division of Fish and Wildlife by email with a request for any information on the species and sent copies of our candidate forms. No response was received.

#### LITERATURE CITED

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APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes, including elevations or removals from candidate status and listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all resubmitted 12-month petition findings, additions or removal of species from candidate status, and listing priority changes.

Approve: **Acting** David W. Wyley  
Regional Director, Fish and Wildlife Service

11/10/05  
Date

Marshall P. Jones

Concur: \_\_\_\_\_  
Director, Fish and Wildlife Service

August 23, 2006  
Date

Do not concur: \_\_\_\_\_  
Director, Fish and Wildlife Service

\_\_\_\_\_  
Date

Director's Remarks:

Date of annual review: 7/21/05

Conducted by: Lorena Wada, Pacific Islands FWO

Comments:

PIFWO Review

Reviewed by:

\_\_\_\_\_  
Assistant Field Supervisor, Endangered Species

Date: \_\_\_\_\_

Patrick Leonard  
Field Supervisor

Date: 10/11/05